

ABSTRACT

The invention provides a system and method for microscopic X-ray fluorescence. An X-ray source, X-ray focusing element and a tapered X-ray opaque focusing aperture provide a focused X-ray spot on a sample. The system translates a sample between an imaging position and a testing position. In the imaging position, the sample is aligned in three dimensions and after alignment, the system automatically translates the sample between the imaging position and the testing position. To avoid collision between the sample and other elements of the system, a position detecting device terminates the sample translation if the sample trips the position detecting device. The focusing aperture of the system has a tapered through opening to block unfocused X-rays and reduce or eliminate a halo effect. To detect low atomic number elements, a detector aperture is vacuum sealed to an X-ray detector and X-ray elements of the system are vacuum evacuated.